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Photograph from J. R. Schmidt

ANOTHER CASUALTY IN THE OHIO VALLEY'S WAR WITH THE RIVER

Floods caused by excessive rainfall are not the only hazards faced by Ohio River craft. Ice gorges sometimes imprison water upstream, and, when the gorge breaks, the water and ice rush down on shipping, crushing large steamers like eggshells, as in the Cincinnati catastrophe pictured above. During the recent Ohio River flood a boat was trapped by high waters between Cincinnati bridges (above) when an 80-foot stage brought the swelling tide up almost to the bridge floors and cut off the approaches on each side (see Bulletin No. 1).

HOW TEACHERS MAY OBTAIN THE BULLETINS

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Ohio River System Drains Area Almost as Large as Texas

FLOOD violence of the Ohio River, which terrorized seven States, carried on its yellow tide potential damage for States comprising almost one-fifth of the whole country.

Ohio overflows bear destruction for not only the States which the river serves as partial boundary—Ohio, West Virginia, Indiana, Kentucky, and Illinois—but usually also for the river's point of origin, Pennsylvania. The same heavy rainfalls may affect States tapped by its far-reaching tributaries—Tennessee, Alabama, North Carolina, and New York.

The Ohio system drains in all some 214,000 square miles, an area 80 per cent as great as that of Texas.

Ohio River Is Full-Grown at "Start"

"Man-made geography," as well as mild weather and excessive rainfall, have all been contributing factors in the river's latest rampage, with a yet unknown toll of lives and property damage.

Even when weather conditions are "normal," the Ohio watershed receives more rainfall than does the Missouri watershed, which is twice as large. One writer estimates that one-fourth of the Mississippi water flowing into the Gulf of Mexico has come roaring down from the Ohio and its tributaries.

The Ohio itself is a full-grown river from the start. It begins at Pittsburgh, where two sizable tributaries, the Allegheny and the Monongahela, join.

Having been made navigable for its entire length, the Ohio is festooned on both sides with strings of industrial towns and cities located for convenience of transportation of raw materials. With lateral canals around the falls at Louisville, the Ohio can offer over a thousand miles of water travel, and with its navigable tributaries furnishes 2,300 miles.

Rapid Flow Has Carved Deep Valley

The river's downward force is about equal to that of two and a half Niagara Falls. Its origin at Pittsburgh is nearly 700 feet above sea level, and it flows into the Mississippi at an altitude of 267 feet. Its actual descent, therefore, is more than 430 feet. The river's force through the ages has carved a relatively narrow valley, in which a sudden rise is particularly destructive.

The annual tonnage of river freight along the Ohio is measured by the million. Flowing from mineral-rich mountains through farming country, it carries coal from Pennsylvania and West Virginia, grain and other farm products from agricultural southern Ohio, Kentucky, and Indiana, iron and steel from Pennsylvania mills, building stone and lumber from the denuded hillsides which drain so disastrously into flood waters.

Sizable floods have swept down the Ohio and its branches for thousands of years, but obviously the destruction caused by the floods has increased with the settling and development of the country during the last two centuries. Rivers out of their banks caused little or no loss to the Indians, most of whose villages were located above the lowlands.

The white colonists who came over the Alleghenies, however, used the Ohio as the principal highroad to the West, and they built their settlements close to the banks. When great cities and industrial districts grew up, railroad yards, highways, warehouses and mills were crowded into the low-lying regions. Slag from blast furnaces was dumped along the river banks, narrowing the channel and raising

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Photograph by Francis Harper

"DE OLD FOLKS AT HOME"—"WAY DOWN UPON DE SWANEE RIBBER"

"One little hut among de bushes, one dat I love, still sadly to my mem'ry rushes," wrote Stephen Foster, in the song that has become a part of American folk music. But it really rushed only to his imagination, for he never saw any "little farm" on the Suwannee. These log cabins stand near the source of the river, in the Okefinokee Swamp of Georgia, from which the Suwannee flows past Fargo into Florida and the Gulf of Mexico (see Bulletin No. 3).

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Explosion Rocks Largest Copper Mine, Chuquicamata in Chile

THE famous Chuquicamata Copper Mine, of northern Chile, last month planned an exhibition of unusual mining technique. But instead it staged a tragedy. Premature explosion of 1,500 tons of dynamite rocked the countryside with the violence of an earthquake, snuffed out the lives of several workmen, and blasted away the face of the cliff on which they were working.

Chuquicamata is a town, a mine, and a hill, and a name that is almost synonymous with copper. Copper has been obtained in this spot since prehistoric natives found that the metal made more convenient weapons and instruments than stone. Within the past twenty-five years, American men and money have brought the mine into large-scale production, creating an industry and a community in the Chilean desert country where even grass will not grow uncoaxed.

Literally a Mountain of Rich Ore

"Chuqui" has been pronounced by mineralogists the greatest single copper deposit known in the world. It contains twice as much ore as all the mines in the United States, and the ore is nearly twice as rich in copper.

The mine is located at Chuquicamata Hill, a bare ridge of yellow rock two and a half miles long, and every bit ore. How far into the earth this deposit extends, no one knows.

This unburied treasure is isolated in the barren coastal range of northern Chile, 160 miles inland from the seaport of Antofagasta and almost two miles above sea level. The countryside is clean-shaven desert, with sparse, gray-green patches around rare water holes. "It looks like rain," the natives comment with sly humor, "every seven years." Rain in far-away Bolivia slakes Chuqui's thirst; pipe lines now bring fresh water to the mining town across the border and a mountain range.

The lure of copper, however, has brought men to this inhospitable spot for centuries. Modern prospectors found Chuquicamata Hill riddled with crude shallow workings like a prairie-dog town. Formerly loads of the blue copper sulphate ore were packed down to the coast on strings of llamas. "Down" meant 9,000 feet down through arid uninhabited desert.

Whole Hillside Is Converted into Copper Bars

Since the beginning of modern exploitation, Chuquicamata has grown into an orderly town of 20,000. Neat streets are lined with concrete houses. Schools, hospitals, and movie theaters have been conjured from the desert by the magic wand of copper. On top of the copper hill are remnants of the abandoned town of Placilla, notorious in the days before the American occupation. Its rip-roaring reputation for violence, which filled a whole graveyard without a single natural death, would cover with blushes the wild West of United States' gold-rush days.

Modern mining on Chuquicamata Hill has not yet needed to descend into the earth. Huge charges of dynamite blast away the face of the hill. Steam shovels load the blasted rock fragments into railroad cars, which run down tracks to huge pulverizing machines. The ore is crushed and dumped into leaching tanks with 10,000 gallon capacity, the copper being separated from the ore by electric current.

Mining problems at Chuqui do not stop with methods of extracting copper. Fresh water must be brought into the desert, sea water must be brought up from the coast, oil for fuel is imported from California or Peru, power plants demand imported coal, and electric current must be carried on high tension wires from the

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the banks. When floods come today, the river rises with terrifying suddenness, and, having few level areas over which to spread out, it climbs into buildings, houses and mills, many of which are wrenched from their foundations.

Some engineers and conservationists believe that the increasing violence of modern floods is partly owing to the things that modern civilization has done to the face of the earth—man-made changes in geography.

Forests at the headwaters have been cut down and, in many instances, not replanted; paved city streets and roads have afforded quick runoff for rainwater; hillsides have been plowed carelessly; smoke and fumes have denuded other hillsides; and large areas have been covered with buildings and residences whose roofs are no checks to the runoff of rainfall.

Most of the dams found in the Ohio watershed are not storage reservoirs, but merely units in water power projects or aids to navigation, such as about fifty on the Ohio itself. Exceptions, however, are the Norris and Wheeler Dams in the Tennessee Valley, a storage dam on the Tygart River in West Virginia, a series on the Miami River in Ohio and a series of fourteen under construction on the Muskingum in Ohio.

Thus, most of the falling drops of water in the area have been helped to flow more quickly into streams—streams such as the Monongahela, Allegheny, and the Ohio that have themselves been narrowed in many sections.

Note: The Ohio River, its tributaries, and the great flood area of the United States are illustrated and described in the following: "Trains of Today and Tomorrow," *National Geographic Magazine*, November, 1936; "Indiana Journey," September, 1936; "Penn's Land of Modern Miracles," July, 1935; "A Patriotic Pilgrimage to Eastern National Parks," June, 1934; "Ohio, The Gateway State," May, 1932; "The Travels of George Washington," January, 1932; "Illinois, Crossroads of the Continent," May, 1931; "The Great Mississippi Flood of 1927," September, 1927; "Pirate Rivers and Their Prizes," July, 1926; "The Origin of American State Names," August, 1920; and "When the Father of Waters Goes on a Rampage," April, 1920.

See also in the GEOGRAPHIC NEWS BULLETINS: "Flood Area a Region of Narrow, Crowded Valleys," week of April 6, 1936.

Bulletin No. 1, February 15, 1937.

Photograph Courtesy U. S. Coast Guard

THE COAST GUARD ALSO GUARDS AN INLAND SEA

No longer are uninhabited coasts and lonely stretches of ocean the only scenes of the Coast Guard's exploits, for detachments were ordered into the Ohio flood area recently, as they were during the flood of 1927. Emergency needs for water transportation inspired automobile factories to manufacture fleets of rowboats; a cash register company made oars. Such rescue work as shown in the scene above prevented heavy property losses near Cairo, Illinois.

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Stephen Foster, a Pittsburgh Minstrel of the South

SCHOOL assemblies, radio programs, music classes, college glee clubs, and civic club dinners recently had extra praise for Old Dog Tray, an extra sigh for the Old Folks at Home, and perhaps a tear for Old Black Joe. Natives of Maine or California alike were more nostalgic than usual for the Swanee River and Old Kentucky Home. This vocal wave of yearning was stirred up by National Stephen Foster Week, which is to become an annual occasion.

Millions have sung their longing to be "way down upon the Swanee River," but few have ever taken the trouble to go down there and see it. Even Foster didn't. As a matter of fact, travelers through south-central Georgia into Florida usually cross the muddy little creek (correctly spelled "Suwannee") unawares.

Stephen Foster, publicity agent supreme for the Southland, was a stay-at-home Pennsylvanian, who is known to have crossed the Mason and Dixon line just twice in his life, and then for comparatively brief periods.

Caught the Steamboat Glamor in "Glendy Burk"

Pittsburgh is the land where he was born, and there, too, the maestro's "in the cold, cold ground." Foster's reputed home there is preserved as a memorial. The famous songwriter's actual home town was Lawrenceville, a village founded by the Foster family as a competitor for the baby metropolis of Pittsburgh, but the baby metropolis grew up first and engulfed it.

A tombstone in Allegheny Cemetery is not Pittsburgh's only monument to the local lad who made good in a musical way. A statue of the sad musician stands in Highland Park. On the University of Pittsburgh campus, in the Cathedral of Learning Triangle, is a combination auditorium and shrine for Foster relics.

Foster did not completely ignore his Pennsylvania surroundings when seeking a song subject. He was impressed by the picturesque river traffic that steamed up and down the Ohio and Mississippi from Pittsburgh to New Orleans. And he did not let the world forget that "the Glendy Burk," in reality the steamer *Glenn D. Burk*, "was a mighty fast boat, wid a mighty fast captain, too." The steamer has vanished from the American scene, but still in Foster's song "de smoke goes up an' de injine roars, an' de wheel goes round and round."

The "Old Kentucky Home" Still Stands

City scenes are rare in Foster's music, although Dolcy Jones "steps so lightly among de bricks and stones." Scenes of most of the pathetic little song-dramas are plantations, sometimes in Kentucky, possibly in Tennessee, perhaps in Lou'siana. There's where Old Black Joe's friends went from the cotton fields away. There Nelly was a lady, and there she died. There Uncle Ned laid down the shovel and the hoe. Foster let the admirer of "Dolly Day" speak for him in "I like to see the clover, dat grows about de lane; I like to see de 'bacco plant, I like de sugar cane."

But Foster rarely saw them. His two excursions down South were a steamboat trip to New Orleans with his wife Jane, in 1852, and a visit at some unspecified time to Kentucky. At Bardstown, Kentucky, not far from Louisville, stands the famous Federal Hill, a dignified mansion of Revolutionary times in which Foster visited his cousins the Rowans—no doubt the only "Kentucky home" he ever knew.

He might have needed a Southern climate for the "Old Massa, don't you cry" type of tune, but around him was local color enough for other kinds. Freed slaves

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coast. On the railroad from Antofagasta to La Paz comes the food, even the ingredients for the daily bread. The daily meat is driven in on the hoof from Bolivia or northern Argentina.

Note: Additional material about Chile will be found in "Twin Stars of Chile," *National Geographic Magazine*, February, 1929; "How Latin America Looks from the Air," October, 1927; "A Longitudinal Journey Through Chile," September, 1922; "The New Map of South America," October, 1921; and "The Awakening of Argentina and Chile," August, 1916.

Bulletin No. 2, February 15, 1937.

NOTE TO TEACHERS

Back copies of several recent issues of the GEOGRAPHIC NEWS BULLETINS are exhausted. Hence requests from teachers who wish their files complete cannot always be filled. A lapse in your receipt of THE BULLETINS may be avoided by sending your renewal remittance of 25 cents in the United States and its possessions (in Canada, 50 cents) promptly when you are notified that your subscription has expired. Because these BULLETINS represent a substantial gift to schools from the National Geographic Society's educational fund, the expense of advertising or circulation promotion cannot be undertaken as would be the case with a commercial publication. The Society must rely upon supervisory officials and teachers to call them to the attention of their colleagues who might use them to advantage in their geography, social sciences, and literature classes.

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"COPPER GOES UP" EVEN WHEN ENROUTE TO MARKET!

Copper comes down in bars to Antofagasta, a seaport ranking fourth among the cities of Chile. The port also serves for landbound Bolivia, across the Andes to the east. The main settlement in 400 miles of barren Atacama Desert, the city is undergoing rapid development, due in large part to shipments of copper from the Chuquicamata mines. As the harbor is poor, cargo must be taken in lighters from shore to ship, and even de luxe passengers must come ashore in launch or rowboat.

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"World's Longest Sore Throat" No Joke to London Giraffe

SIX FEET of sore throat was the modest complaint of Maudie, a giraffe in the London Zoo, recently. Whereas other sore throats have been numerous and painful enough this winter, such an ailment as Maudie's is still spectacular.

Fogs give giraffes sore throats and colds. The much joked about pain in the world's longest neck is a pain also to zoo keepers, for sick giraffes are not good patients. They are extremely nervous, and show alarm at the least cause. They have been known to drop dead when their keepers approached to give them medicine.

Yet, whatever their ills, giraffes do not raise their voices in complaint. Many a naturalist has insisted that they are voiceless animals, unable to make a sound even when in agony. A denial of this once came from Africa, where a Kenya game warden averred that a young giraffe, if separated from its mother, will bawl and low like a hungry calf.

Giraffe's Neck Has No More Bones Than Man's

Whether mute or not, the giraffe is one of the world's most peculiar animals. It has at least two other claims to distinction. It is the world's tallest mammal and one of the most expensive animals found in menageries.

A giraffe's neck, long as it is, contains no more vertebrae than does the neck of a man. It is elongation of the vertebrae, and not additional bones, that elevates the giraffe's head among the treetops.

Possessing few means of defense, giraffes are protected by their coloration. Their irregularly marked coats blend so perfectly with the dappled sunlight and shadows of the trees on which they feed that at a distance they are difficult to detect. Thorny acacias do not prove a trial to them, for the animals' tough hides protect them from long thorns, and their elastic tongues taper to pluck leaves and avoid surrounding thorns.

When feeding among the tree tops, 16 or 18 feet above the ground, the giraffe's long-lashed eyes can scan a wide range for menacing enemies. When grazing, however, or drinking from a water hole, the animal cannot see lions prowling in the surrounding grasses. Since a springing lion could break a giraffe's neck, it is fortunate that the giraffe can survive a long time between drinks. Dew on leaves helps to quench the animal's thirst.

World's Tallest Mammal Is Delicate, Nervous, and Timid

Lions usually stalk a giraffe in pairs. Attacked by a single lion, a giraffe might be able to fend it off by kicking viciously, or to shake the lion off its back and escape by running.

Giraffes usually seek safety in flight. Hunters pursuing them on horseback do not have an easy time catching up, for they sometimes travel more than 30 miles per hour. Given a five minutes' lead, especially over uneven ground, they can outrun a fleet Sudan horse. Young giraffes begin galloping shortly after they are born, and usually keep up with the herd.

Africans hunt these animals for food, and for their tough hides, out of which to make shields and sandals. They often strip the hide off in pieces 30 feet long. Although hunting has rapidly decreased the number of giraffes, many herds still roam the heart of Africa.

Giraffes are among the most costly animals in captivity, not so much because

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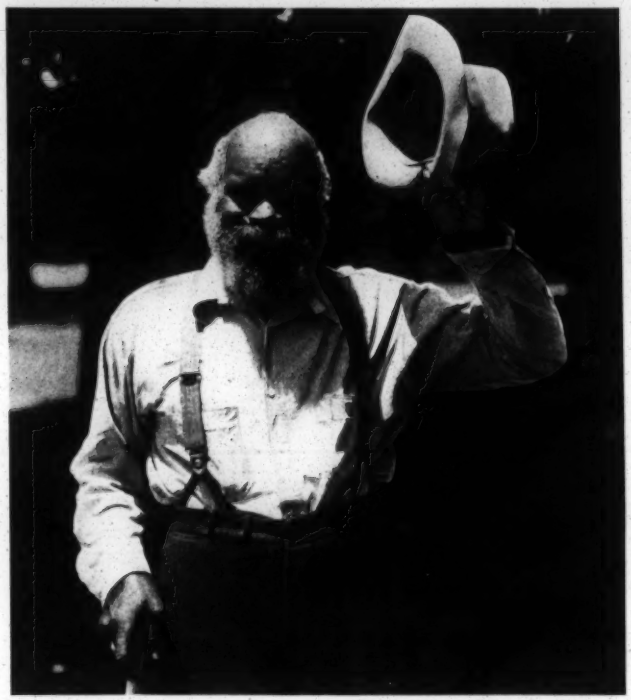
in the North could have inspired songs about the Camptown races "gwine to run all night" or the permanent goodbye to Tennessee in "Farewell, my Lilly dear." Frolickers anywhere would be glad to "bring de broom along and sweep de kitchen clean and hab a little song" with Nelly Bly. Many graduates of the "underground railway" could truthfully say, with the black boy-friend of "Oh! Susanna," that "I came from Alabama with my banjo on my knee." Roustabouts along the Ohio might sing "Way down in Ca-i-ro," the little town at the Ohio's mouth.

Foster knew the Ohio well, for most of his life was spent in Pittsburgh, and river commerce was also important in Cincinnati, where, as a bookkeeper, he made his one brief attempt to transform a musician into a business man. Yet he left the "Beautiful Ohio" for someone else to write songs about. His choice of the Suwannee was made, however, not because it had sentimental associations but because the name could be condensed into two syllables. Rejecting Yazoo and Peedee, he wrote "Swanee" into "Old Folks at Home," seizing upon it as soon as suggested by his brother, who had just made a "sight-seeing tour" through an atlas!

Note: Pittsburgh, where Stephen Foster lived and wrote many of his unforgettable songs, is described in "Penn's Land of Modern Miracles," *National Geographic Magazine*, July, 1935.

Descriptions and photographs of the places pictured in Foster's songs are found in "A Patriotic Pilgrimage to Eastern National Parks," *National Geographic Magazine*, June, 1934; "The Okefinokee Wilderness," May, 1934; "Ohio, The Gateway State," May, 1932; "Louisiana, Land of Perpetual Romance," April, 1930; "Florida—The Fountain of Youth," January, 1930; and "Marching Through Georgia," September, 1926.

Bulletin No. 3, February 15, 1937.



Photograph by Edwin L. Wisherd

"HE HAD NO WOOL ON THE TOP OF HIS HEAD IN THE PLACE WHERE THE WOOL OUGHT TO GROW"

Like "Uncle Ned," this old slave has now "gone where the good darkies go." He was the property of the Rowan estate at Bardstown, Federal Hill, now a memorial as Foster's Kentucky home. Another memorial to a Foster song is a granite shaft in Fargo, Georgia, where the Suwannee River passes.

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Johannesburg Leads a Double Life, Above Ground and Below

LIFE began at fifty for Johannesburg. Quietly growing since its initial boom a half century ago, the city last September opened the gates of its Empire Exposition, and experienced such a rush of visitors that huge, double-decked street cars have just been put into service transporting them.

Johannesburg, the largest city of South Africa, has been attracting international attention with the Empire Exposition. With thousands of displays showing progress in arts and industries throughout the British Empire, the Exposition was allotted a hundred acres of spacious Milner Park, on the outskirts of the city. One spectacular exhibit is a working model of Victoria Falls, one of South Africa's chief tourist lures. The model is one-sixtieth the actual size of Victoria, and is framed in trees that were transplanted from the forests near the falls.

The city of Johannesburg is nine hundred miles inland and a mile up. When summer heat and humidity oppress coastal dwellers, those who can afford it seek Johannesburg as a vacation resort.

Tourist Rush a Half-Century After Its Gold Rush Origin

Motoring through its more than 800 miles of well-paved streets and boulevards, the visitor passes many-storied business buildings and handsome residences. After mingling with a busy portion of its 500,000 inhabitants in its fine shops; strolling through its magnificent parks and playgrounds, its museums, and art exhibits; and glimpsing the size of its great industries, the stranger may be startled at the guidebook statement: "Johannesburg was fifty years old last year."

Now the city covers 80 square miles. In 1886 its site was part of a broad farming area on the high African veldt. In that year an English miner named Walker stubbed his toe on an outcropping of gold ore there, and that stumble led to discovery of the most valuable gold deposit the world has ever known.

As soon as the Walker discovery became known, one of the major gold rushes of all time was on. Englishmen, Portuguese, Spaniards, Germans, Frenchmen, and Americans arrived in droves, reaching the spot on foot when other means of transportation failed. Overnight a village of ramshackle huts and tents sprang up. Many pioneers delayed building homes, and lived in covered wagons while they feverishly nicked the Witwatersrand, or the Rand, as the gold-bearing ledge was called, for ore. The settlement was named for Johannes Rissik, prominent Dutchman.

The Buried City Where Men Live by Artificial Light

Life in the city was none too pleasant at first. Dust from the mine dumps was annoying; and, as in the "rush towns" of America's early West, laws were lax. But dust meant prosperity to Johannesburg, as truly as smoke means prosperity to Pittsburgh and other great industrial centers.

Even now Johannesburg is not entirely free from the dust nuisance, especially during dry seasons. In and around the city are somewhat dismal spots that recall early mining camp days. But the city has become the metropolis of South Africa, and its humming business center is comparable to that of great cities on the world's other continents.

Johannesburg is splendidly equipped with recreational features. Tennis is a favored game, and tennis courts seem to occupy nearly every vacant lot of sufficient

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they are scarce, as because they are temperamental. They are timid, nervous, and delicate. Necessary surgical operations can be performed on many wild animals, but seldom on giraffes.

Legs of the young frequently swell, become crooked and too weak to support them. These animals find unusual ways to hurt themselves. In the Calcutta Zoo one hanged himself by catching his neck in a forked branch.

Note: The following *National Geographic Magazines* contain photographs of giraffes: "Scenes of Sunny Africa," June, 1935; "Flights from Arctic to Equator," April, 1932; "The Land of Sawdust and Spangles," October, 1931; "Under the South African Union," April, 1935; "Cairo to Cape Town, Overland," February, 1925; and "Timbuktu, in the Sands of the Sahara," January, 1924.

Bulletin No. 4, February 15, 1937.

© *Herbert Lang*

A GIRAFFE IS NATURALLY "ON THE LOOKOUT"

The watchful aspect of these giraffes, peering over the brush in Kruger National Park, South Africa, is accentuated by the "conning tower" neck with which each animal, even the youngsters in the foreground, is equipped. Protective coloration camouflages the three young so effectively that they could be easily overlooked. Catching giraffes in pitfalls or traps is out of the question because of injury that would result to their necks and legs. The usual method of capturing them is to pursue a herd until the young drop out exhausted, or to drive several into a corral, or fenced pen.

size. Motorists throng the paved roads out of the city. Nearby lakes afford relaxation to lovers of aquatic sports, woodland trails lure the hiker, and green fairways invite the experts as well as "duffers" with their mashie-niblicks.

The workaday scenes of Johannesburg's gold mines are as fascinating to the visitor, however, as any recreation spots. High, wide, and dusty, the mine dumps of the Rand may be uninteresting in themselves, but they are monuments to the gold that built the city.

The mines present a unique sight. One descends to the workings in a "skip" at the speed of an express elevator. Far below the surface he steps out into an underground world with avenues and cross streets, alive with working men, illuminated by electricity. Though the visitor sees only a fragment, he is really in a vast subterranean city, larger in some ways than the daylight city above. Its axis measures 70 miles, and its population numbers nearly 200,000 workmen.

Note: Johannesburg is also described in "Men and Gold," *National Geographic Magazine*, April, 1933; "Under the South African Union," April, 1931; and "Cairo to Cape Town, Overland," February, 1925.

Bulletin No. 5, February 15, 1937.

© *Publishers' Photo Service*

MOUNTAINS FOLLOWED MEN TO JOHANNESBURG

"Old as the hills" in Johannesburg would mean something comparatively new. For these white mounds are dumps of waste sand disgorged from gold mines after the gold has been extracted. Miles and miles of them surround Johannesburg, changing the geography of the flat countryside since the discovery, fifty years ago, and feverish working of the Witwatersrand gold fields.

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